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ABSTRACT

Many researchers have questioned the validity of the underlying assumptions, the psychometric properties, and conceptualizations for both the older and new measures that generate two independent scores for masculinity and femininity. The assumptions of bipolarity and unidimensionality and the construct validity of existing masculinity/femininity inventories have been identified as the main areas of criticism. An early-adolescent sample of 418 junior high students and a post-adolescent population of 442 college students were given the Femininity Scale from the California Psychological Inventory and the Bem Sex Role Inventory to examine the psychometric properties and underlying assumptions of these two different measures of masculinity and femininity, as well as the utility and interpretation of each measure. Comparisons were made between the two tests and between age groups. Factor analyses suggested that both tests were multidimensional. The bipolarity of masculinity-femininity was not supported. Sex and age differences were found in the factor pattern and correlations with factors. Conceptual problems inherent in the constructs of masculinity and femininity because of present empirical definitions suggest a need for changes in terminology and assessment approaches. (Author)

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A Factor-Analytic Comparison of Two Measures of Masculinity-Femininity in Post- and Early Adolescent Populations

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A Factor-Analytic Comparison of Two Measures of Masculinity/Femininity in Post- and Early Adolescent Populations

The present study compared two very different measures of masculinity/femininity in two populations, early-adolescent and post-adolescent. The Femininity Scale (Fe) from the California Psychological Inventory (CPI) (Gough, 1952) is representative of a number of empirically-derived measures of masculinity-femininity based on the assumption that M/F is a unidimensional, bipolar trait. The Bem Sex-Role Inventory (BSRI) is a relatively new inventory (Bem, 1974) that treats masculinity and femininity as two conceptually and empirically independent dimensions rather than as the two opposing ends of a single continuum. Although the BSRI represents a departure from traditional measures in that it represents masculinity and femininity as two orthogonal dimensions rather than one bipolar dimension, it was also empirically constructed.

A number of review articles and conceptual papers (Constantinople, 1973; Gonen & Lansky, 1968; Kelly & Worell, 1977; Locksley & Colten, 1979; Moreland, Gulanick, Montague, & Harren, 1978; Pedhauzur & Tetenbaum, 1979; Sassenrath & Yonge, 1979; Spence & Helmreich, 1978) have questioned the validity of many of the underlying assumptions, psychometric properties, and conceptualizations for both the older, bipolar measures and the newer measures that generate two independent scores for masculinity and femininity. Three main areas of criticism have been identified -- the assumptions of bipolarity and unidimensionality, and the construct validity of existing M/F inventories.

After examining traditional measures of masculinity/femininity that assume a unidimensional, bipolar continuum, Constantinople (1973) concluded that the constructs are not necessarily bipolar nor unidimensional. In an attempt to remedy this unquestioned and untenable treatment of M/F, Bem (1974) constructed

the Bem Sex-Role Inventory. The inventory treats masculinity and femininity as two conceptually and empirically independent dimensions (each generating a separate score). Recent factor analytic studies using the BSRI, however, provide considerable evidence that the inventory consists of more than two dimensions, and that one of the factors (dimensions) may be bipolar (Bohannon & Mills, 1979; Gaudreau, 1977; Moreland, Gulanick, Montague, & Harren, 1978; Pedhauzur & Tetenbaum, 1979; Waters, Waters, & Pincus, 1977).

No theoretical or conceptual definition of masculinity and femininity were provided by the authors of traditional, bipolar scales since the underlying rationale or premise for the construction of a test based on differential item response for the sexes was that masculinity and femininity are the psychological equivalent of biological sex. Bem asserts that scores from her masculine and feminine scales reflect an instrumental and expressive (Parsons & Bales, 1955) or agentic and communal (Baken, 1966) orientation. Her choice of items for the three dimensions (masculine, feminine, and neutral), however, was based on an empirical approach rather than a theoretical definition of the constructs; i.e., what is considered "desirable" for a male or female in our society. The question of what the various tests of masculinity and femininity are really measuring (i.e., construct validity) is extremely troublesome and can only be addressed indirectly since the assessment of the validity of a measure is not possible when the construct it is supposed to be measuring is undefined.

Both measures selected for the present study (the Fe Scale from the CPI and the BSRI) have been used extensively with college populations and to a lesser extent with non-college populations. Norms for adolescent populations are available for the Fe Scale, but are unavailable for the BSRI. The purpose of the present study was to examine the psychometric properties and assumptions underlying these two very different measures of masculinity and femininity and

to compare them with each other within both a college and early adolescent population. The utility and interpretation of each measure was examined, with particular emphasis on the properties of unidimensionality and bipolarity.

Subjects: A cross-section of 7th and 8th grade students from the Baltimore public school system constituted the early adolescent population which contained 230 males and 188 females. The post adolescent population consisted of 221 male and 221 female undergraduate college students from the Johns Hopkins University.

Procedure: The 38-item Fe Scale and the 60-item BSRI were administered to classrooms of students from both populations over a period of two weeks. All participants were assigned sex-role classifications based on their Bem masculinity and femininity scores, using a modified version of Bem's dual median-split procedure (Bem, 1977). In addition, each subject received a "femininity" score from the Fe based on the summation of all items answered in the "feminine" direction.

Separate principal components analyses without iteration were performed on the intercorrelations of the 38 items on the Fe Scale and on the intercorrelations of the 60 items on the BSRI for each of the two subject populations. The number of factors extracted from each scale was determined using multiple criteria. A varimax rotation of the factors followed. An item with a factor loading greater than .35 was selected as representing that factor. Correlations were computed between all scale scores, factors, and biological sex.

Results

Factors - BSRI

For the post adolescent population, five factors were found for the BSRI, accounting for approximately 41% of the variance. The first factor included

15 of the original "masculine" items (see Table 1) and seemed to reflect what Bem referred to as an Instrumental-Agentic style or orientation. The factor correlated -.18, $p < .001$ with biological sex (1=male; 2=female). Factor 2 contained 12 of the original "feminine" adjectives plus 6 "neutral" adjectives (helpful, happy, sincere, likeable, friendly, and tactful). This factor was labeled an Expressive-Communal orientation and its correlation with biological sex was .08. Factor 3 was suggestive of social maturity since it contained such items as reliable, truthful, conscientious, and decisive as well as negative loadings for unpredictable, inefficient, and gullible. The correlation with sex was .14. The items on Factor 4 suggest a rather retiring, unpleasant personality style, and this factor was not correlated with sex. Factor 5 contained only four adjective, three "masculine" (masculine, athletic, and competitive) and one "feminine" (feminine) adjective with a negative loading. This bipolar factor appeared to be a sex of subject factor since it correlated -.64, $p < .001$ with biological sex. There was an extremely high correlation between the adjectives masculine and feminine ($r = -.84$, $p < .001$), indicating a consistent response for individuals to rate themselves high on one and low on the other. The correlation between the adjectives feminine and masculine with the sex of the individual was .68 and -.67, respectively ($p < .001$). This "sex of subject" factor has been found repeatedly in factor analytic studies of the BSRI (Gaudreau, 1977; Moreland, et al., 1978; Sassenrath & Yonge, 1979; Waters, et al. 1977). In addition, Pedhauzur & Tetenbaum (1979) have shown through a discriminant analysis that the difference between males and females in scale scores on the BSRI is almost singularly due to their ratings on the two items "masculine" and "feminine" and not to the composite masculinity and femininity scales when comprised of the remaining 38 items.

For the early adolescent population, six factors were found, accounting for 40% of the total variance (see Table 2). Factors 1 and 2 were analogous to the first two factors found in the older population; i.e., an expressive-communal factor and an instrumental-agentic factor. A negative personality and social maturity factor were also found with this population. The sex of subject factor was evident in this analysis, and again was strongly correlated with biological sex (-.84, $p < .001$). One additional factor was found for this population, a negative mood factor. Besides the significant correlation between the sex of subject factor, the only other factor to be significantly correlated with sex was the expressive-communal one with a correlation of .24, $p < .01$.

Factors - Fe Scale

For the Fe Scale, five factors were found in the early adolescent population and four factors in the post adolescent population (see Tables 3 & 4). Three very similar factors were found in both populations -- a "stereotypic female" and "macho male" factor, as well as a "neurotic" factor. The remaining two factors in the younger population were identified as moral/introversion and an intellectual/political factor. The remaining factor for the older group was reflective of boisterous extraversion. Both the stereotypic female and macho factor were significantly correlated with biological sex (.65, $p < .001$ and -.42, $p < .001$ in the older population and .56, $p < .001$ and -.37, $p < .001$ in the younger population). Although the neuroticism factor was significantly correlated with sex (.17, $p < .001$) in the older population (because of the large N), it accounted for less than 4% of the variance.

The correlation between sex and the total Fe and BSRI scale scores, as well as the correlation between the scale scores themselves can be seen in Table 5 and Table 6. It is important to note that the correlation between the BSRI Masculinity and Femininity scores and sex were significantly reduced for the college sample

(-.21, $p < .001$ and .24, $p < .001$) when the two adjectives masculine and feminine were removed from the total scores. Correlations between Fe scale scores and BSRI masculinity and femininity scale scores were computed for both samples as a whole as well as for the sample broken down by sex-role classification. Of the 442 subjects in the college sample, 29% were masculine sex-typed, 31% were feminine sex-typed, and 40% were balanced. In the early adolescent population, 20% were masculine sex-typed, 15% feminine sex-typed, and 65% balanced. For sex-typed individuals in the college sample, the correlation between Fe scores and BSRI masculinity and femininity scores was -.61 ($p < .001$) and .58 ($p < .001$), respectively. For "balanced" individuals, the correlations were -.07 ($p < .25$) and .16 ($p < .05$), respectively. For the 7th and 8th grade population, Fe correlated with BSRI masculinity and femininity -.41 ($p < .01$) and .33 ($p < .01$) for sex-typed individuals. For "balanced" individuals in this group, the correlations were -.07 and .05.

Conclusions

The results indicate that both the Fe and the BSRI are multidimensional scales (for both age groups). In addition, the bipolarity of the M/F dimension was not supported. Although Gough (19520 noted that the item content of the Fe scale appeared to fall into several clusters, he regarded the scale as a unidimensional measure of masculinity and femininity. The present study indicates that the items on the scale actually define <u>at least</u> 3 independent dimensions (of approximately equal importance and stable across age groups) which reflect (a) a preference for more "feminine" occupations and a tendency to be high-strung, (b) neurotic tendencies, and (c) a preference for more masculine occupations and interests. The ability of the Fe to differentiate males from females was moderate, with more variance on the scale accounted for (35%) in the younger population than in the post adolescent population (21%). The

two factors on this scale carrying the major part of the differentiating role were the masculine and feminine factors reflecting largely occupational interests/stereotypes. As sex-roles and occupational stereotypes continue to change, I would expect the correlations between sex and occupational interests to reflect these changes. The fact that the sexes were differentiated better in the early adolescent sample most likely reflects the overwhelming peer pressure at this time to conform to social stereotypes in terms of occupational choices and interests. With age and education (as in the college population) comes more freedom from such conservative expectations.

Bem's original conceptualization of the BSRI is not completely consistent with the data of this study. Although two factors, descriptive of an instrumental/agentic personality style and an expressive/communal personality style, were found to account for the most variance on the inventory and could thus be contrued as representing Bem's masculinity and femininity scales, the homogeneity and interpretability of these two scales could be increased if some of the original items were deleted. In addition, a sex of subject factor and social maturity factor were found -- a finding consistent with several other factor-analytic examinations of the BSRI. The negative factor found for both age groups represents all the "undesirable" characteristics found on the scale and probably represents a true "social desirability" validity scale.

Unlike the Fe scale, the Bem inventory is based on the conceptualization of masculinity and femininity as independent of biological sex. Although the present study found that biological sex and scores on the BSRI were significantly correlated, it was found that the two adjectives masculine and feminine were largely responsible for this correlation. In fact, besides the sex of subject factor, no factor on the BSRI accounted for more than 6% of the variance when correlated with sex.

Bem also treats masculinity and femininity as two conceptually and empirically independent dimensions from each other. Although the correlation between these scales was significant for the college sample, only about 3-1/2% of the variance between these scales is in common. In addition, a positive correlation between the two scales was found for the 7th and 8th graders; whereas, a large negative correlation would be expected if masculinity and femininity were at opposite ends of a bipolar continuum. Thus, the present findings support the general notion of two relatively independent dimensions rather than a single, bipolar continuum.

Correlations between Fe scores and Bem masculinity and femininity scores were moderate for college students and nonsignificant for the younger population. The relationship, however, was stronger for conventionally sex-typed individuals than for individuals whose sex-role identity was more balanced. What the two scales have in common seems to be associated with a stereotype of masculinity and femininity.

Although the factor structure for each test was very similar in both age groups, some interesting age differences can be seen in the correlations between biological sex and the various scales. First, the Fe scale differentiates males from females on the basis of response better in the younger population -- emphasizing a conventional adherence to traditional occupational and interest patterns for the sexes at this age. Second, males and females in the younger population were significantly different in terms of femininity on the BSRI but not masculinity, a finding reported for other early adolescent and grade school groups (Hall & Halberstadt, 1977). On the other hand, the sexes differ significantly in the college sample for both masculinity and femininity. This may reflect a developmental trend for the sexes to differ in terms of expressive traits at a very early age and remain so, while instrumental traits are

encouraged and expressed equally in both sexes through junior high school. The socialization process, as well as peer pressures, result in the suppression of such "masculine" traits in females so that by college females and males differ significantly in the degree to which they can report high leadership skills, independence, and decision-making ability.

It is suggested that the terms "instrumental-agentic" and "expressive-communal" personality style are more appropriate for the two major factors or dimensions on the BSRI because of the excessive cultural definitions and affective connotations associated with the terms masculinity and femininity.

Masculinity and femininity (as these constructs are currently used) have never been conceptually defined. If the terms have <u>any</u> psychological reality it is as complex constructs that embrace constellations of attitudes, behaviors, interests, and values that can be identified by early adolescence and remain quite stable. No one test of M/F covers all that can be subsumed under the umbrella of masculinity and femininity, especially when our present empirical definition is what males do and what females do. To this we should add "what males and females think and feel" that differentiates them from one another. Thus, any test or inventory must be very careful to delineate exactly what it is about males and females it is measuring. We should also be cognizant of the fact that what we are measuring is sex-<u>role</u>-related dimensions and thus the dimensions of masculinity and femininity are time and culture bound -- as males and females change, so do masculinity and femininity. The only alternative to this conceptual merry-go-round is to evolve a truly psychological definition of masculinity and femininity, <u>or</u> to simply discard the terms and recognize that we are chasing a "will-o'-the-wisp" that vanishes as soon as we get close enough to grab hold of it and that perhaps even if we did manage to capture it we would find it inconsequential and lacking in substance.

TABLE 1

Factors - BSRI
(Post Adolescent Population)

Factor One "Instrumental"	Factor Two "Expressive"	Factor Three "Social Maturity"	Factor Four "Retiring"	Factor Five "Sex"
Assertive (M)	Sympathetic (F)	Reliable (N)	Moody (N)	Masculine (M)
Dominant (M)	Compassionate (F)	Gullible (F)(-)	Soft-spoken (F)	Feminine (F)(-)
Strong personality(M)	Gentle (F)	Flatterable (F)(-)	Solemn (N)	Competitive (M)
Forceful (M)	Sensitive to the needs of others(F)	Inefficient (N)(-)	Secretive (N)	Athletic (M)
Aggressive (M)	Understanding (F)	Childlike (N) (-)		
Acts as a leader (M)	Tender (F)	Conscientious (N)	(4 items)	(4 items)
Has leadership abilities (M)	Warm (F)	Jealous (N)(-)		
Willing to take a stand (M)	Affectionate (F)	Unpredictable (N)(-)	(Sex r=.00)	(Sex r=-.64)
Independent (M)	Eager to soothe hurt feelings(F)	Unsystematic (N)(-)		
Defends own beliefs(M)	Tactful (N)	Makes decisions easily (M)		
Individualistic (M)	Sincere (N)	Truthful (N)		
Ambitious (M)	Helpful (N)			
Self-sufficient (M)	Likeable (N)	(11 items)		
Willing to take risks (M)	Friendly (N)			
	Loves children (F)	(Sex r=.14)		
Theatrical (N)	Cheerful (F)			
Shy (F)(-)	Loyal (F)			
Self-reliant (M)	Happy (N)			
(17 items)	(18 items)			
(Sex r=-.18)	(Sex r=.08)			

TABLE 2

Factors - BSRI
(Early Adolescent Population)

Factor One "Instrumental"	Factor Two "Expressive"	Factor Three "Maturity"	Factor Four "Negative"	Factor Five "Sex"	Factor Six "Mood"
*Aggressive (M)	*Eager to soothe hurt feelings (F)	Independent (M)	Inefficient (N)	*Masculine (M)	Moody (N)
*Dominant (M)	*Sympathetic (F)	Individual-istic (M)	Unsystematic(N)	*Feminine (-F)	Happy (-N)
*Acts as a leader(M)	*Warm (F)	*Truthful (N)	Gullible (F)	*Competitive (M)	Secretive (N)
*Forceful (M)	*Compassionate (F)	Assertive (M)	Jealous (N)		Cheerful (-F)
*Strong personality (M)	*Gentle (F)	Self-reliant (M)	Childlike (F)	(3 items)	
*Has leadership abilities (M)	*Tender (F)	Defends own beliefs (M)	Unpredictable(N)		(4 items)
Soft-spoken (-F)	*Loves children (F)	Willing to take a stand (M)	Conventional(N)	(Sex r=-.84)	(Sex r=-.08)
Athletic (M)	*Understanding (F)				
*Willing to take risks (M)	*Friendly (N)	(7 items)	(Sex r=.10)		
*Shy (-F)	*Affectionate (F)				
Makes decisions easily (M)	*Sensitive to the needs of others (F)	Sincere (N)			
	*Helpful (N)	Tactful (N)			
(11 items)	*Likeable (N)	Analytical (M)			
		Loyal (F)			
(Sex r=-.05)	(13 items)	*Reliable (N)			
		Does not use harsh language(F)			
	(Sex r=.24)	Self-sufficient(M)			
		Ambitious (M)			
		*Conscientious (N)			
		(16 items)			
		(Sex r=.08)			

*items found on the same factor for both populations

TABLE 3

Factors - Fe
(Early Adolescent Population)

Factor One "Macho"	Factor Two "Neurotic"	Factor Three "Stereotypic Female"	Factor Four "Intellectual/ political	Factor Five "Moral/Introversion"
I think I would like the work of a garage mechanic.	I get very tense and anxious when I think other people are disapproving of me.	A windstorm terrifies me.	I'm pretty sure I know how we can settle the international problems we face today.	I must admit that I enjoy playing practical jokes on people (-).
I like mechanics magazines.	Sometimes I feel that I am about to go to pieces.	I think I would like the work of a dress designer.	I think I could do better than most politicians if I were in office.	I like to be with a crowd who play jokes on one another (-).
I think I would like to drive a racing car.	I am inclined to take things hard.	I like adventure stories better than romantic stories (-).	I want to be an important person in the community.	I think I would like the work of a librarian.
I would like to be a soldier.	I get excited very easily.	I would like to be a nurse.	The average person is not able to appreciate art and music.	I become quite irritated when I see someone spit on the sidewalks.
At times I feel like picking a fist fight with someone.	Sometimes I have the same dream over and over.	I prefer a shower to a tub bath (-).	(4 items)	I like to go to parties and other affairs where there is lots of loud fun (-).
I very much like hunting.	It is hard for me to start a conversation with strangers.	I think I would like the work of a clerk in a large department store.	(Sex r=-.14)	If I get too much change in a store, I always give it back.
I think I would like the work of a building contractor	The thought of being in an automobile accident is very frightening to me.	(6 items)		I think I am stricter about right and wrong than most people.
(7 items)	I am somewhat afraid of the dark.	(Sex r=.56)		(7 items)
(Sex r=-.37)	I must admit that I feel sort of scared when I move to a strange place.			(Sex r=.17)
	(9 items)			
	(Sex r=.16)			

TABLE 4

Factors - Fe
(Post Adolescent Population)

Factor One "Macho"	Factor Two "Neurotic"	Factor Three "Stereotypic Female"	Factor Four "Boisterous Extraversion"
*I think I would like the work of a building contractor.	*I get very tense and anxious when I think other people are disapproving of me.	*I think I would like the work of a dress designer.	I like to be with a crowd who play practical jokes on one another.
*I think I would like the work of a garage mechanic.	*I must admit I feel sort of scared when I move to a strange place.	If I were a reporter, I would like to report news of the theatre.	I must admit that I enjoy playing practical jokes on people.
*I like mechanics magazines.	*I am somewhat afraid of the dark.	*I like adventure stories better than romantic stories.(-)	I like to go to parties and other affairs where there is lots of loud fun.
*I think I would like to drive a racing car.	*It is hard for me to start a conversation with strangers.	*A windstorm terrifies me.	At times I feel like picking a fist fight with someone.
*I very much like hunting.	*I am inclined to take things hard.	Sometimes I feel that I am about to go to pieces.	In school I was sometimes sent to the principal for cutting up.
*I would like to be a soldier.	I am very slow in making up my mind.	*I would like to be a nurse.	(5 items)
(6 items)	(6 items)	I become quite irritated when I see someone spit on the sidewalk.	(Sex r=.02)
(Sex r=-.42)	(Sex r=.17)	I get excited very easily.	
		*I prefer a shower to a tub bath.(-)	
		I think I would like the work of a librarian.	
		*I think I would like the work of a clerk in a large department store.	
		(11 items)	
		(Sex r=.65)	

*items found on the same factor for both populations

Table 5

Correlations for the BSRI and Fe Scale Scores

for the Early Adolescent Population

	Fe	BSRI Fem	BSRI Masc
BSRI Fem	.07[a] (.33)[1](.05)[2]		
	.17[b]		
BSRI Masc	-.22 (-.41)[1](-.07)[2]	.25*	
	.02	.34*	
Sex	.58*	.31*	.04

Table 6

Correlations for the BSRI and Fe Scale Scores

for the Post-Adolescent Population

	Fe	BSRI Fem	BSRI Masc
BSRI Fem	.46*[a] (.58)[1](.16)[2]		
	.32*[b]		
BSRI Masc	-.30* (-.61)[1](-.07)[2]	-.19*	
	-.27*	-.21*	
Sex	.46*	.40* (.24)[3]	-.41* (-.21)[3]

* $p < .001$

[a] males

[1] Correlations for "sex-typed" subjects

[2] Correlations for "balanced" subjects

[3] Correlation with adjectives "masculine" and "feminine" removed

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